OVERVIEW THE RELATIVE EFFECTIVENESS OF INDONESIAN

POLICY MEASURES DURING AND AFTER FINANCIAL CRISIS

YULI TEGUH HIDAYAT[1] & TUMPAK SILALAHI[2]

Doctoral Student, Faculty of Economics, Padjadjaran University, Bandung, Indonesia

Original Article

ABSTRACT

The objective of this research is to overview the impact of crisis and policy measures taken during the crisis, evaluate the effectiveness of those measures and analyze the exit strategy in Indonesia. To achieve those objectives, this paper will review some policy measures in monetary, fiscal and financial sectors that had been taken to deal with the 2008 global financial crisis using descriptive and statistical analysis. Based on finding, we could conclude that Indonesia had clearly demonstrated the effective and timely response of monetary, fiscal and financial sector policies which helped Indonesia to recover from global economic crisis.

Additionally, the econometric model was used to evaluate the impact of monetary and fiscal policy to economic output using quarterly data from 1990 - 2010. The result shows that monetary and fiscal policies have significant impact to economic output. In the short run the changes in real GDP is significantly affected by changes in real monetary supply in the previous three quarter and real fiscal expenditures. The lesson learned from this research among other are that cooperation and coordination among the policy makers and the timely responses are very important in tackling the crisis; an effective conventional monetary policy in normal times may become less effective in a crisis thus unconventional monetary policy indeed necessary as timely policy response and the improvement for more timely disbursement of government expenditure is important to increase the effectiveness of this policy to stimulate economic output. Moreover, several Indonesian exit strategy and policies to face future challenges are very important to reach the ultimate objective of sustainable economic growth while maintaining macroeconomic stability.

JEL Classification: E52, E62, E63

KEYWORDS: Monetary Policy, Fiscal Policy, Financial Sector Policy, Global Financial Crisis

INTRODUCTION

The global financial crisis in 2008 had an impact on Indonesian economy as can be explored by assessing Indonesian macroeconomic and financial institution indicators. As a small open economy, Indonesia could not be immune from impact of external shocks. The integration in financial sector has left many countries particularly for open economy to contagion risk. The pressures in the global liquidity had caused a massive short term portfolio capital outflow followed by a decline of Indonesia's financial market performances. In the real sectors, reflecting the input of global slowdown, exports declined and it had an indirect impact on household and private sector's income, leading to a decline in Indonesia's consumption and investment.

All over the globe, at the period the crisis, The Government and The Central Bank implemented policy

measure in monetary, fiscal and financial sectors to deal with the global financial crisis. Bank Indonesia had implemented an accommodative monetary policy in order to keep a moderate growth achieve at least by maintaining financial markets liquid which was facilitated by relatively low inflation. The policy rate was brought down in December 2008 with the intention to decrease banks' lending rates. Some unconventional monetary policy measures such as narrowing the interest rate corridor for standing deposit and lending facility had also been taken to address liquidity issues. On the fiscal side, the government provides policy response to keep domestic demand by several fiscal stimulus and trade policies. There were also coordination between Ministry of Finance, Central bank and other institutions in order to maintain financial and macroeconomic stability.

With this background, this paper is aimed to review the policy measures taken during the crisis, evaluating their effectiveness and analyzing the exit strategy to reach the ultimate objective of sustainable economic growth while maintaining macroeconomic stability in Indonesia. In turn this is expected to make a contribution to a comprehensive evaluation of the effectiveness of the policy measures in SEACEN Economies. To handle the broad issues in the paper, two methodologies are adopted: firstly, by descriptive analysis using simple statistics and graphics; and secondly, by econometric model to analyze the relative effectiveness of policy choices. However, it is difficult to analyze the effectiveness of policy choices exclusively during the crisis with an econometric model, since then we have only limited period of data. Therefore, we will analyze relative effectiveness of policies from 1990 – 2010 using Error Correction Model.

The Hyphothesis

There are two arguments between economist about the policy measure to respond the turbulence during the economic crises. The first argument who support the idea that monetary policy is the first line of defense during the turbulance while the second opinion believe that fiscal policy has a more important role particularly when conventional monetary policy measures are not sufficient enought in addresing losses in output due to weakening of economy. As it has stated before, the objective of this paper is to identify and evaluate policy measures during the global financial crisis 2008's so the next sections will explore and review the effectiveness of those policy measures..

The policy choices available during the global financial crisis to maintain economic stability consist of Monetary Policy, Fiscal Policy and Financial Sector Reforms. In examining the relative effectiveness of both monetary and fiscal policies on economic growth, we use the Engle and Granger two step estimating procedure which allows an explicit testing of co-integration and specification of the Error Correction Model (ECM).

The relationship between monetary policy and economic growth was derived from the general theoretical framework formed by Quantity Theory of Money with the following identity:

$$MV = PY \tag{1}$$

M refers to money stock, V velocity of circulation, P price level and Y income. If V is constant then there is a relationship between changes in the stock of money and changes in the value of national income.

$$M = kPY \tag{2}$$

The relationship between fiscal policy and economic growth could be explained through the national income identity.

$$Y = C + I + G + (X - M) \tag{3}$$

Model Specification, Data sources and Limitations

Empirical model in this paper is aimed at testing the relationship of economic growth with monetary policy, fiscal policy and other control variables.

$$Yt = f(MP_t, FP_t, Z_t) \tag{4}$$

Where Y is a measure of economic activity, MP, a measure of monetary policy, FP measure of fiscal policy and Z is other control variables that may affect economic activity.

In the end, the general form of the Error Correction Model (ECM) specification in this paper is:

$$\Delta Y_t = \sum_{j=1}\sum_{k=0}\beta_{1jk}\Delta X_{jt-k} + \sum_{k=0}\beta_{2k}\Delta Y_{t-k-1} + \lambda ECM_{t-1} + C + e_t \tag{5}$$

Where:

Y= dependent variables (economic output)

X = independent variables, consists of monetary variables, fiscal variables, and other control variables

ECM = residuals from long run relationship between variable

n= number of explanatory variable in the model

p= number of lags used to represent the short run dynamics in the model

There are several variables which could be used as proxies for of economic activity, fiscal policy, monetary policy and control variables as outlined in the table below. We use quarterly data from 1990 Q1 to 2010 Q2. Some of variables were adjusted for seasonality using Census X12 method.

Table 1: List of Variables

Indicator	Variable	Sources	Notes
Growth	GDP Real	IFS, staff estimated	
	GDP Nominal	IFS	
Fiscal	Fiscal Balance	BI	
	Government Revenue	BI	
	Government Expenditure	BI	
	Primary Expenditure		Government Expenditure – Interest Payment
	Primary Balance	BI	
Monetary	M1	IFS	
	M2	IFS	
	Policy Rate	BI	Prior to Q3 2005, we use SBI 1 month as proxy for policy rate

Table 1: Contd.,			
Inflationary Effect	GDP Deflator	IFS, staff estimated	
	CPI	BI	
External Sector	Exchange Rate	IFS	
	Current Account Balance	IFS	
Dummy Recession	1997/1998 Recession	Estimated	Q1 1997 – Q4 1998
	2008/2009 Recession	Estimated	Q4 2008 – Q2 2009

Notes: All variable are in logarithm, except Fiscal balance, primary balance, current account balance (because they contains negative values) and dummy recession (binary 1/0)

The data collection consist of monetary policy, fiscal policy and financial sector reform gathered from the data of Bank Indonesia as an authority of monetary policy and bank supervision and regulation in Indonesia. For the fiscal policy and non bank financial supervision data collected from the Ministry of Finance. The data was colected with data series since January 2008 before the global crisis until 2010.

The Result

To characterize the time series property of the variables, instead of using the Augmented Dickey-Fuller (ADF) tests, it used Phillips Perron (PP) methods. This PP approach is more appropriate than ADF since the data shows a structural break as effect of 1997/1998 crisis. Both of the ADF and PP test indicate that most of the series are non-stationary when the variables are defined in levels, except Fiscal Balance, Primary Balance, Policy Rate and Current Account Balance. But first-differencing the series removes the non-stationary components in all cases and the null hypothesis of non stationary is clearly rejected at the 5% significance level suggesting that all variables are integrated of I(1). Thus, the next step of testing for possible cointegration relationship will be done only with the I(1) variables.

Table 2: Unit Root Test for Variables

Variables	Abbreviation	ADF Test Result					Phillips Perron Test Result				
		Level		1st difference		Level of integration	Level		1st difference		Level of integration
		t-stat	p-values	t-stat	p-values		t-stat	p-values	t-stat	p-values	
Real GDP	RGDP	-2.631	0.268	-2.139	0.032	I(1)	-2.327	0.415	-8.320	0.000	I(1)
Nominal GDP	NGDP	-2.038	0.572	-5.929	0.000	I(1)	-2.117	0.529	-5.491	0.000	I(1)
Real GDP_Adjusted	RGDP_SA	-2.214	0.475	-5.216	0.000	I(1)	-1.921	0.634	-5.159	0.000	I(1)
Nominal GDP_Adjusted	NGDP_SA	-1.913	0.639	-1.957	0.049	I(1)	-1.869	0.661	-2.939	0.004	I(1)
Fiscal Balance	FB	-4.231	0.006	-6.526	0.000	I(0)	-9.025	0.000	-29.488	0.000	I(0)
Government Revenue	GR	5.943	1.000	-17.544	0.000	I(1)	2.972	0.999	-42.299	0.000	I(1)
Government Expenditure	GE	5.327	1.000	-20.666	0.000	I(1)	2.100	0.991	-36.833	0.000	I(1)
Primary Expenditure	PRIM_GE	5.137	1.000	-20.657	0.000	I(1)	1.976	0.988	-42.757	0.000	I(1)
Primary Balance	PB	-5.436	0.000	-6.289	0.000	I(0)	-7.132	0.000	-26.702	0.000	I(0)
Fiscal Balance_Adjusted	FB_SA	-3.074	0.003	-12.525	0.000	I(0)	-8.552	0.000	-20.894	0.000	I(0)
Government Revenue_Adjusted	GR_SA	4.040	1.000	-15.234	0.000	I(1)	3.211	1.000	-15.292	0.000	I(1)
Government Expenditure_Adjusted	GE_SA	3.562	1.000	-10.192	0.000	I(1)	4.154	1.000	-18.761	0.000	I(1)
Primary Expenditure_Adjusted	PRIM_GE_SA	4.400	1.000	-11.337	0.000	I(1)	3.046	0.999	-18.449	0.000	I(1)
Primary Balance_Adjusted	PB_SA	-1.843	0.063	-12.502	0.000	I(0)	-7.297	0.000	-23.681	0.000	I(0)
M1	M1	-2.348	0.404	-1.880	0.058	I(1)	-2.369	0.393	-7.610	0.000	I(1)
M2	M2	-0.933	0.947	-8.250	0.000	I(1)	-0.933	0.947	-8.248	0.000	I(1)
M1_Adjusted	M1_SA	-1.496	0.823	-3.371	0.001	I(1)	-1.641	0.768	-5.250	0.000	I(1)
M2_Adjusted	M2_SA	-0.864	0.955	-6.885	0.000	I(1)	-0.941	0.946	-3.738	0.000	I(1)
Policy Rate	PR	-3.265	0.020	-7.633	0.000	I(0)	-3.000	0.039	-7.646	0.000	I(0)
GDP Deflator	GDPDEFL	-2.125	0.524	-4.443	0.000	I(1)	-1.871	0.661	-4.293	0.000	I(1)
GDP Deflator_Adjusted	GDPDEFL_SA	-2.271	0.444	-3.798	0.000	I(1)	-1.849	0.672	-3.798	0.000	I(1)
CPI	CPI	-2.402	0.376	-3.049	0.003	I(1)	-2.208	0.478	-4.278	0.000	I(1)
Exchange Rate	ER	-1.845	0.673	-5.637	0.000	I(1)	-1.221	0.899	-6.479	0.000	I(1)
Current Account Balance	CAB	-3.021	0.003	-11.764	0.000	I(0)	-3.021	0.003	-16.024	0.000	I(0)
GDP US	USGDP	-0.215	0.992	-2.199	0.028	I(1)	-0.249	0.991	-3.144	0.002	I(1)
GDP Japan	JPGDP	1.014	0.917	-3.321	0.001	I(1)	1.351	0.955	-16.482	0.000	I(1)

Following the Engle and Granger two step-method, in the next step we estimate the long run equilibrium relationship among variables by OLS and test for stationary of the residuals, in the form:

$$y_t = \alpha_0 + \alpha_1 x_t + e_t$$

(6)

To identify the unit root in the residuals, it used critical values for the Engle - Granger Cointegration Test provided in Enders (2004). After estimating several alternatives model based on the variables, so the best long run cointegration equations as follow:[1]

$$RGDP\_SA = \ 5.13 \ + \ 0.88 \ RM1\_SA \ + \ 0.20 \ RGE\_SA$$

(7)

$$(0.05)^{***} \quad (0.03)^{***} \quad (0.25)^{***}$$

R2 = 0.94

The critical value of residual unit root test from this equation is -6.61, and given the critical value of Engle - Granger Cointegration Test for 2 variables which is -4.123 for significance at 1%, then variables real GDP, real M1 and real government expenditures are said to be cointegrated.

Next step is to switch to a short run model with an error correction mechanism in the form:

$$\Delta RGDP\_SA_t = \sum_{j=1}\sum_{k=0} \beta_{1jk} \Delta X_{jt-k} + \sum_{k=0} \beta_{2k} \Delta RGDP\_SA_{t-k-1} + \lambda ECM_{t-1} + crisis + C + e_t$$

(8)

Where X consists of real M1, real government expenditure and other control variables, meanwhile ECM is residuals from equation (7). To address the impact of crisis, it also used dummy recession variables CR97 and CR08. With general to specific approach to several combinations of cointegrated variables and lags, the best models found as follows:

Table 3: Error Correction Models

| Variables	Dependent : Real GDP		
	Coefficient	T-stat	
Real M1(-3)	0.07	2.17	**
Real Gov_Exp	0.03	3.92	***
ECM(-1)	-0.06	-1.91	*
Exchange Rate (-1)	-0.04	-2.95	***
Inflation (-1)	-0.29	-5.63	***
Crisis 97	-0.01	-2.06	**
Constant	0.02	11.36	***
R2	0.66		
DW-Stat	2.00		
SIC	-5.76		

*** significant at α = 1%, ** significant at α = 5%, * significant at α = 10%

Analysis of Results

---

[1] RM1_SA defined as real seasonally adjusted M1 which equal to nominal M1/GDP Deflator. RGE_SA defined as real seasonally adjusted government expenditure which equal to nominal government expenditure/GDP Deflator. *value in ( ) shows standard error.* *** *significant at α = 1%, ** significant at α = 5%, * significant at α = 10%* . We realize that there might be endogenity relationship between RM1_SA and GDP_SA, but to be inline with the agreed methodology we assume the one-way relationship between them and use ECM. For robustness, we also use VECM and found the long run relationship between those variables (in appendix).

The empirical results show that Real GDP cointegrated with real M1 and real fiscal expenditure. On the basis of this information, an error correction model was developed which was shown to be well-specified relative to its own information set and capable of parsimoniously representing the data set.

From the error correction models, it could be concluded that in the short run the changes in real GDP is significantly affected by changes in real fiscal expenditures and real monetary changes. The previous real GDP changes are not significant to affect real GDP changes. The crisis 1997 decrease the real GDP significantly, meanwhile the crisis 2008/2009 effect is not significant. The result also shows a well-defined error correction term, and indicates a feedback of 6% of the previous quarter's disequilibrium from the long run money supply, and fiscal expenditure to economic activity. To evaluate the goodness of the model, I did some in sample forecasting and compared the result with the actual data. The result was quite good as shown in Graph 1. The root mean square error (RMSE) of the forecast was only 0.01.
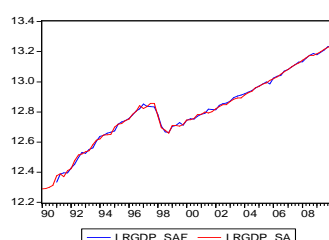
Graph 1: Evaluation of Model

The lag in the effect of monetary changes relative to fiscal policy as shown in table 4 indicates that the impact of fiscal policy on GDP is relatively faster than monetary policy. This result is in line with the Elmendorf and Furman (2008) which consider that a key potential advantage of fiscal stimulus relative to monetary stimulus was that it could boost economic activity more quickly, and true fiscal stimulus implemented promptly can provide a larger near-term impetus to economic activity than monetary policy.

Table 4: Evaluation of the Effective Fiscal Stimulus Principles

Principles	Explanation	Measure for Indonesia's Fiscal Stimulus						Explanation
		1	2	3	4	5		
Timely	FS should not be enacted prematurely, delayed too long, or consist of tax cuts or spending increases that would take too long to be implemented or to boost output		☑				Less Effective	Although government immediately giving instruction for FS, but there were problems that delaying the implementation or disbursement of the fund. The government expenditure is mostly disbursed in Q-4 (Graph 26)
Targeted	Tax cuts and spending increases should be directed so that they provide the greatest benefit to people who are affected most adversely by an economic slowdown				☑		Effective	▪ → Although the biggest proportion of the FS is tax reduction, but this could stimulate economic output from investment and indirectly would increase employment and wages. Then, these will increase consumption and economic output. ¶ ▪ → Moreover, the big spending in infrastructure is good because it will boost a sustainable growth in longer term instead of only short term ¶
Temporary	The FS should not increase the budget deficit in the long run			☑			Quite effective	The source of fund for fiscal stimulus is come from the excess of budget utilization (SILPA) in 2008 and debt. Fund from excess of budget utilization won't affect the next government budget but the usage of debt, in the long term could impact the budget deficit. Additionally, the budget deficit plan in 2010 still relatively high (1.6% GDP) (Table 15)

Note: The 1 – 5 interval scale is based on authors' opinion, which number 1 indicate the policies are ineffective and number 5 indicate the policies are very effective.

CONCLUSIONS AND POLICY RECOMMENDATION

This paper finds that the effect of global financial crises on Indonesian economy caused by sudden stop of capital inflow to emerging market indicate by declining of the economic growth for three quarter during the quarter III 2008 until first semester of 2009. Evidence shows that Indonesia impacted by the global financial crisis resulted from sudden stop capital inflow into emerging market countries and declining global economy growth. Hence, the impact on macroeconomic indicators can be identified by the first and second round effects. The first lesson from the recent crisis is that Indonesia as part of emerging country clearly demonstrated the effectiveness of timely monetary, fiscal and financial sector policy which helping Indonesia to recover from economic crisis. Indonesia and mostly Asian country had experienced the financial crisis during the last ten years. The first Asian crisis episode occurred in 1997 had significant reformation in the financial sector both in policy reform and institutional reform. However, in the second crisis ten years later known as global financial crisis occurred in 2008, the reform, can be categorized as soft reform relatively compare to the first Asian crisis.

The second lesson is that the closer cooperation and coordination among the policy maker is very important in identifying and tackling a global crisis. During the crisis period, some policy measures in monetary, fiscal and financial sectors had been taken to deal with the global financial crisis. On the Central Bank authority, Bank Indonesia had implemented an accommodative monetary policy in order to keep a moderate growth and relative low inflation. The policy rate started to decline on December 2008 with the intention to decrease bank's lending rates. Some unconventional monetary policy had also taken to address liquidity issues. On the fiscal side, the government gives responses to keep domestic demand by several fiscal stimulus and trade policies. There were also coordination between Ministry of Finance, Central bank and other institutions in order to maintain financial market and macroeconomic stability.

The policy measures had been taken during the crisis formulated in a timely manner with the ultimate objective of sustainable economic growth while maintaining macroeconomic stability in Indonesia. Based on error correction models, we could conclude that in the short run the changes in real GDP is significantly affected by changes in fiscal expenditures and inflation. Meanwhile the monetary policy changes and the previous real GDP changes are not significant to affect real GDP changes. Hence, since the conventional monetary policy is not enough during the high degree of uncertainty particularly pressure from external circumstances, thus unconventional monetary policy will enrich the monetary instrument.

REFERENCES

1. *Indonesian Economic Outlook 2009-2014, "Global Financial Crisis and the Impact on Indonesian Economy", Bank Indonesia*

2. *Enders, Walter, (2004), "Applied Econometric Time Series", John Wiley & Sons, Inc, USA*

3. *Elmendorf, Douglas and Furman Jason, (2008), "If, When, How: A Primer on Fiscal Stimulus", Bookings Institution, The Hamilton Project Strategy Paper*

4. *Folorunso, B.A and Ajisafe, R.A., (2002), " The Relative Effectiveness of Fiscal And Monetary Policy In Macroeconomic Management In Nigeria, **The African Economic and Business Review**, Vol. 3, No. 1, Spring*

5. *Simorangkir, Iskandar and Justina Adamanti, (2010), "The Role of Fiscal Stimulus and Monetary Easing in Indonesian Economy during Global Financial Crisis: Financial Computable General Equilibrium Approach", Presented at Call for Papers - EcoMod2010, Istanbul, July 7-10, 2010.*

6. *Svensson, Lars E.O, (2009), "Flexible Inflation Targeting: Lessons from the Financial crisis". Speech at the workshop Towards A New Framework For Monetary Policy? Lessons From The Crisis, Organized by de Nederlandsche Bank,*

Amsterdam.

7.   *Yudo, Teguh et all, (2009), "The Impact Of The Global Financial Crisis On Indonesia's Economy". Centre for Strategic and International Studies (CSIS)*

8.   *Yoopi Abimanyu (2000), Sectoral Contribution to Indonesia's Economic Recovery: The Potential of Agriculture and Agribusiness.*

9.   *2008 Economic Report On Indonesia. Bank Indonesia Annual Publication*

10. *2009 Economic Report On Indonesia. Bank Indonesia Annual Publication*

11. *"Krisis Global dan Penyelamatan Sistem Perbankan Indonesia" (2010). Bank Indonesia (available on bahasa)*

APPENDICES

Table 5: Key Indicators Measuring Vulnerability of Economy for

External Shocks – 1997/98 and 2008/09 Recession

Indicator	1996		2007	
	US $ Billions	% of GDP	US $ Billions	% of GDP
GDP (Current)	227.37		432.04	-
Exports of Goods and Services	50.19	22%	118.01	27%
Foreign Currency Reserves	17.82	8%	54.74	13%
Imports of Goods and Services	44.24	19%	85.26	20%
Average Monthly Imports	3.69	-	7.10	-
Months of Imports Covered	4.83	-	7.70	-
Balance on Current Account	-7.80	-3%	10.49	2.4%
Total Government Debt			147.51	34.1%
Foreign Debt	110.17	48%	141.18	32.7%
Composition of External Liability				
Short term	22.03	9.7%	27.49	6.4%
Long term	88.14	38.8%	113.69	26.3%
Debt Service Payment (foreign)	2.82	1.24%	2.8	0.7%
Primary Balance	4.55	2.00%	3.3	0.8%
Fiscal Deficit	1.73	0.76%	-5.5	-1.3%

Table 6

Indicator	1996	2007
Bank Loan to Deposit Ratio (LDR)	109.26	69.22
Non Performing Loan		4.64
Bank Capital Adequacy Ratio	11.82	19.30
ICRG	70.00	70.50
Stock Market Index (last position)	637.43	2,745.83
GDP Growth (yoy)	7.8%	6.3%
S & P Rating		BB -
Inflation	5.12%	5.60%
Output Gap*	149.293	10.852

  Note *: Calculated by HP Filter Method Using Annual Real GDP Data in Billion Rp

  ***Source :** IFS, CEIC, Bank Indonesia and staff estimates*